



DEPARTMENT OF TRANSPORTATION

Federal Motor Carrier Safety Administration

[Docket No. FMCSA-2022-0163]

Agency Information Collection Activities; New Information Collection: Human Factors Considerations in Commercial Motor Vehicle Automated Driving Systems

AGENCY: Federal Motor Carrier Safety Administration (FMCSA), Department of Transportation (DOT).

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, FMCSA announces its plan to submit the Information Collection Request (ICR) described below to the Office of Management and Budget (OMB) for its review and approval and invites public comment. This notice invites comments on a proposed information collection titled *Human Factors Considerations in Commercial Motor Vehicle Automated Driving Systems*. It is a driving simulator study with a series of questionnaires that will evaluate how commercial motor vehicle (CMV) drivers engage in Society of Automotive Engineers (SAE) Level 2 (L2) and Level 3 (L3) automated driving system (ADS)-equipped CMVs. Approximately 100 CMV drivers will participate in the study. The study will examine the effect of non-driving secondary task engagement, transfer of control, and training on driver behavior in ADS-equipped CMVs.

DATES: Comments on this notice must be received on or before [Insert date 60 days after date of publication in the FEDERAL REGISTER].

ADDRESSES: You may submit comments identified by Federal Docket Management System Docket Number FMCSA-2022-0163 using any of the following methods:

- Federal eRulemaking Portal: <https://www.regulations.gov>. Follow the online instructions for submitting comments.

- Fax: 1-202-493-2251.
- Mail: Dockets Operations; U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Ground Floor, Room W12-140, Washington, DC 20590-0001.
- Hand Delivery or Courier: U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Ground Floor, Room W12-140, Washington, DC, 20590-0001 between 9 a.m. and 5 p.m. e.t., Monday through Friday, except Federal holidays.

Instructions: All submissions must include the Agency name and docket number. For detailed instructions on submitting comments, see the Public Participation heading below. Note that all comments received will be posted without change to <https://www.regulations.gov>, including any personal information provided. Please see the Privacy Act heading below.

Docket: For access to the docket to read background documents or comments received, go to <https://www.regulations.gov>, and follow the online instructions for accessing the docket, or go to the street address listed above.

Privacy Act: In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its decision making. DOT posts these comments, without edit, including any personal information the commenter provides, to <https://www.regulations.gov>, as described in the system of records notice (DOT/ALL-14 FDMS), which can be reviewed at <https://www.dot.gov/privacy>.

Public Participation: The Federal eRulemaking Portal is available 24 hours each day, 365 days each year. You can obtain electronic submission and retrieval help and guidelines under the “FAQ” section of the Federal eRulemaking Portal website. If you want us to notify you that we received your comments, please include a self-addressed, stamped envelope or postcard, or print the acknowledgement page that appears after

submitting comments online. Comments received after the comment closing date will be included in the docket and will be considered to the extent practicable.

FOR FURTHER INFORMATION CONTACT: Theresa Hallquist, Office of Research and Registration, DOT, FMCSA, West Building 6th Floor, 1200 New Jersey Avenue SE, Washington, DC 20590-0001; 202-366-1064; theresa.hallquist@dot.gov.

SUPPLEMENTARY INFORMATION:

Background

Lower levels of automated driving system (ADS)-equipped CMVs present an environment that is ripe for overreliance. An L2 vehicle offers longitudinal and lateral support to the driver; however, the driver is still responsible for driving at all times. At this level, engaging in non-driving secondary tasks can be highly detrimental to driving performance as the driver may not recognize and respond to hazards timely or appropriately. In an L3 vehicle, the role of distraction is blurred. The driver takes on a more supervisory role and is in full control of the vehicle in a limited number of situations. When an L3 vehicle alerts the driver that a takeover is required, the driver needs to have situational awareness to resume full control of the vehicle. Engagement in non-driving secondary tasks may prevent the driver from maintaining situational awareness of the driving environment.

A recently completed study by FMCSA on research involving ADSs in CMVs found a lack of research related to ADS-equipped CMVs. To date, most commercial ADSs on U.S. roadways are in passenger vehicles, and CMV ADSs are only recently being implemented in real-world operations. Therefore, FMCSA needs more data on ADS-equipped CMVs to understand driver behavior and policy implications.

The purpose for obtaining data in this study is to evaluate driver readiness to assume control in SAE L2 and L3 ADS-equipped CMVs and develop and test a CMV driver distraction training program designed to improve driver readiness. Specifically,

there are three primary objectives for the data collection: (i) determine the effect of distraction on CMV drivers of L2 vehicles; (ii) determine the effect of transfer of control on CMV drivers in L3 vehicles; and (iii) develop and evaluate a training program that is designed to decrease the levels of distraction that were identified in CMV drivers in L2 vehicles and designed to improve the problems with the transfer of control that were identified in L3 vehicles. Answers to these research questions will provide insight into the human factors associated with semi-automated CMVs. Moreover, these findings will inform training materials to educate drivers on distraction and the functionality of ADS as well as policy pertaining to the implications of ADSs in CMVs.

The study includes data collection from a series of questionnaires and a driving simulator-focused experiment. The collected survey data will support the simulator experiment data. The survey data will be used in two ways: in the assessment of driving performance data as covariates in the model (to control for certain demographic variables, such as age, gender, and experience) and to answer a research question on the relationship between driver characteristics and driver readiness and performance. Data on driver readiness and performance will be collected from the simulator experiment. Eligible drivers will hold a valid commercial driver's license, currently drive a CMV, be 21 years of age or older, and pass the motion sickness history screening questionnaire.

Data will be collected over two study sessions. The first study session will collect data on the effects of non-driving secondary tasks and readiness to resume control of an L2- or L3-equipped CMV. The second study session will assess the effectiveness of driver training to improve safety while operating an L2 or L3 CMV. Questionnaire data will be collected prior to the simulator study, during the simulator study, and after the simulator study. In addition, participants will complete questionnaires about the training in the second study session. All questionnaires will be preloaded in an app format for drivers to complete on a tablet.

We anticipate 100 participants in total for the driving simulator study. Fifty drivers will participate in the L2 study sessions, and the other 50 drivers will participate in the L3 study sessions. During consent, each participant will agree to participate in both the L2/L3 simulator study session and the training study session. For a participant who chooses not to continue, a new driver will be recruited to fill their position. These new participants will not have data from the L2/L3 study but will need to complete a new consent form, pre-/post-study questionnaires, and the training questionnaire. Each study session will be completed in 4 hours, resulting in a total of up to 8 hours of participation for drivers that complete both study sessions.

Multiple analyses will be used, including an assessment of driver distraction and its effects on driver readiness and driving performance. In the L2 and L3 studies, general linear mixed models (GLMMs) will be used to answer the research questions. In the transportation safety field, GLMMs are often used to analyze driver behavior and assess relationships between driving scenarios and behaviors. To evaluate the effectiveness of the training program, linear mixed models will be used with random intercepts. Driver random intercepts will account for participants' correlated behaviors and expectations in the L2 or L3 system before and after training.

Title: Human Factors Considerations in Commercial Motor Vehicle Automated Driving Systems

OMB Control Number: 2126-00XX.

Type of Request: New ICR

Respondents: CMV drivers

Estimated Number of Respondents: 100

Estimated Time per Response: 4 hours

Expiration Date: This is a new ICR.

Frequency of Response: Two responses

Estimated Total Annual Burden: 475.5 hours

PUBLIC COMMENTS INVITED: You are asked to comment on any aspect of this information collection, including: (1) whether the proposed collection is necessary for the performance of FMCSA's functions; (2) the accuracy of the estimated burden; (3) ways for FMCSA to enhance the quality, usefulness, and clarity of the collected information; and (4) ways that the burden could be minimized without reducing the quality of the collected information. The Agency will summarize or include your comments in the request for OMB's clearance of this ICR.

Issued under the authority of 49 CFR 1.87.

Thomas P. Keane,
Associate Administrator,
Office of Research and Registration.

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